

ART. II. FOSSIL RODENTS FROM THE
UINTA EOCENE SERIES

BY J. J. BURKE

The fossil rodents treated in the following paper were collected in the Uinta Basin in northeastern Utah, by field parties of the American Museum of Natural History and of the Carnegie Museum. The species *Ischyrotomus eugenei* sp. nov. is represented in the collections of the Carnegie Museum by specimens from the Myton Member of the Uinta Eocene Series. *Pareumys grangeri* sp. nov. and *Pareumys* (?) *troxelli* sp. nov. are from the Wagonhound Member of the Uinta Eocene Series and the types of these species are preserved in the collections of the American Museum of Natural History; I am indebted to the latter institution and to Dr. Walter Granger, the Curator of Fossil Mammals, for the privilege of describing this material. The illustrations for this article are from drawings by Mr. Sydney Prentice.

Family PARAMYIDÆ Miller and Gidley¹

Genus ISCHYROTOMUS Matthew

Ischyrotomus eugenei sp. nov.

Holotype: Both rami of lower jaw and fragment of LM³, C. M. No. 11983.

Horizon: Myton Member, Uinta Eocene Series.

Locality: Head of west fork of Antelope Draw, beneath the rim of Deadman Bench, Uinta County, Utah.

Diagnosis: Incisor flattened and jaw generally much as in *Ischyrotomus petersoni* Matthew, but a much larger species (length of cheek tooth row of holotype *circa* 31 mm.); jaw more robust throughout and diastema relatively shorter.

¹I am in favor of restricting the term *Paramyidæ* to the assemblage of genera formerly included in the genus *Paramys*. Miller and Gidley (Jour. Wash. Acad. Sci., Vol. VIII, No. 13, pp. 439-440, 1918) proposed the family to include "*Paramys*, *Mysops*, *Prosciurus* and related genera." *Prosciurus* might find its place here, but *Mysops* and the "related genera" may well await further study before inclusion in this community.

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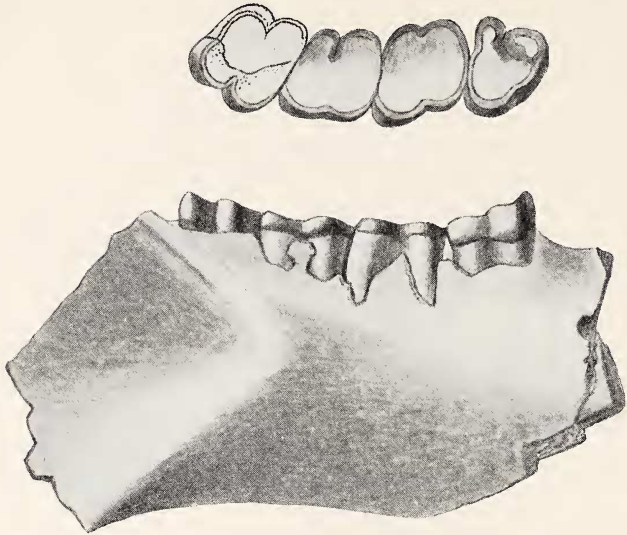


FIG. 1. *Ischyrostomus eugenei* Burke, holotype, C. M. 11983. External view of right mandibular ramus and occlusal view of cheek teeth of the same. RM₃ partly restored in outline from LM₃. $\times \frac{3}{2}$.

This species is the largest known member of the *Paramyidae* and is the Myton Member derivative of the stock represented in the Wagon-hound Member by *Ischyrotomus petersoni* Matthew.

The outer half of M³ of the holotype is worn, but preserves some details of the pattern. The anterior valley of this tooth is narrow and the external cusps crowded together; a very small external intermediate cuspule is present. The paracone is elevated above the metacone, but the latter cusp, while quite low, exceeds the paracone in antero-posterior extent, forming the entire postero-external angle of the crown. The posterior cingulum is short transversely and the metaconule appears to be represented by a triangular spur from the worn internal shelf.

A second specimen, C. M. 11793, from the Myton Member at Myton Pocket, Little Pleasant Valley, near Myton, Utah, is also referred to this species. The left ramus contains a broken incisor and P₄-M₃; the external walls of the cheek teeth have been badly shattered. A fragment of the right ramus, preserving a broken M₃, is likewise present. The cheek teeth are not as worn as those of the holotype; the inner slopes of the lingual cusps are gently concave, forming broad

and shallow central basins; the true central valleys extend transversely across the floor of these basins as narrow fissures. In each cheek tooth a short stubby spur from the hypoconid extends into the central basin. RM₃ of C. M. 11793 shows a narrow, transverse external valley and a small external intermediate cuspile.

MEASUREMENTS

Holotype, C. M. 11983

RM ³ antero-posterior.....	7.6 mm.	
	Right ramus	Left ramus
Inferior I antero-posterior.....	7.7 mm.	7.5 mm.
Inferior I transverse.....	6.7 mm.	6.7 mm.
P ₄ antero-posterior.....	7.5 mm.	6.8 mm.
P ₄ transverse.....	8.5 mm.	8.2 mm.
M ₁ antero-posterior.....	7.9 mm.	7.6 mm.
M ₁ transverse.....	8.8 mm.	
M ₂ antero-posterior.....	7.6 mm.	
M ₂ transverse.....	8.3 mm.	
M ₃ antero-posterior.....		7.0 mm.
M ₃ transverse.....		7.8 mm.
P ₄ -M ₃ , greatest length.....	31.0 mm.	30.6 mm.
M ₁₋₃ , greatest length.....	23.7 mm.	23.5 mm.
Length of diastema between inferior I and P ₄ (estimated).....	10.0 mm.	
Depth of ramus under M ₁	23.1 mm.	

Family ISCHYROMYIDÆ Alston

Genus PAREUMYS Peterson

Pareumys grangeri sp. nov.

Holotype: Right ramus of mandible with P₄ M₁₋₃, A. M. N. H., No. 1869.

Paratype: Right ramus of mandible with M₁₋₃, A. M. N. H., No. 1905.

Horizon: Wagonhound Member, Uinta Eocene Series.

Locality: White River, Uinta County, Utah.

Diagnosis: P₁M₃. Approaching *Pareumys milleri* Peterson in general construction, but a smaller species; lower jaw shallower, cusps less erect, protoconids less crescentic, entoconids less prominent, trigonid cusps (particularly in P₃) less widely separated, hypolophulid crests of molars more transverse, crests connecting protoconids and hypoconids of M₂₋₃ not as angulate, and posterior valleys narrower.

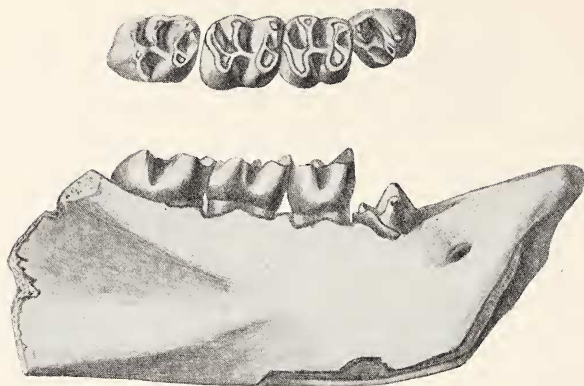


FIG. 2. *Pareumys grangeri* Burke, holotype, A. M. N. H. 1869. External view of mandibular ramus and occlusal view of cheek teeth, x 5.

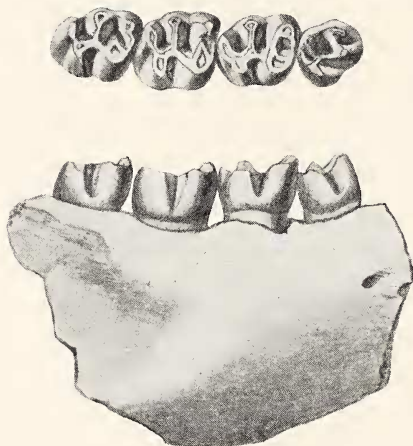


FIG. 3. *Pareumys milleri* Peterson, referred specimen, C. M. 12062. External view of mandibular ramus and occlusal view of the cheek teeth, x 5.

As Wilson² has noted in a recent paper, *Pareumys* is referable to the *Ischyromyidae* rather than to the *Muridae*. Peterson, in the type description,³ placed the genus in the latter family but the molar

²Wilson, Robert W., "Cricetine-like Rodents from the Sespe Eocene of California." *Proc. Nat. Acad. Sci.*, Vol. 21, No. 1, p. 31, 1935.

³Peterson, O. A., "Report upon the Material Discovered in the Upper Eocene of the Uinta Basin by Earl Douglas(s) in the Years 1908-1918 and O. A. Peterson in 1912." *Ann. Carn. Mus.*, Vol. XII, p. 66, fig. 7, 1919.

pattern of the type of *Pareumys milleri* Peterson is characteristically Ischyromyid. A specimen, C. M. No. 12062, taken from the same locality as the type, fig. 3, shows the cheek tooth formula to be $P_1\bar{M}_3$; the general construction of the specimen indicates that *Pareumys* is merely a specialized off-shoot from the Bridger rodents which Troxell⁴ includes under the genus *Tillomys* Marsh. *Pareumys grangeri* sp. nov., which comes from a lower horizon than the genotypic species, approaches Bridger forms such as *Tillomys parvus plicatus* Troxell. However, since the form under description seems to be nearer *Pareumys* in size, lesser elevation of the trigonids, and in general strengthening of the connecting crests, I am placing it in Peterson's genus. The species forms an excellent link between *Pareumys milleri* Peterson and its Bridger relatives.

MEASUREMENTS

	Holotype A.M.N.H. 1869	Paratype A.M.N.H. 1905
Inferior I antero-posterior.....	2.5 mm.	2.2 mm.
Inferior I transverse.....	1.2 mm.	1.4 mm.
P ₄ antero-posterior.....	1.7 mm.	
P ₄ transverse.....	1.5 mm.	
M ₁ antero-posterior.....	1.7 mm.	1.7 mm.
M ₁ transverse.....	1.7 mm.	1.7 mm.
M ₂ antero-posterior.....	1.8 mm.	1.7 mm.
M ₂ transverse.....	1.9 mm.	1.9 mm.
M ₃ antero-posterior.....	2.5 mm.	2.4 mm.
M ₃ transverse.....	1.9 mm.	2.0 mm.
M ₁₋₃ , greatest length.....	5.8 mm.	5.8 mm.
P ₄ -M ₃ , greatest length.....	7.4 mm.	
Diastema between inferior I and P ₄	3.7 mm.	
Depth of ramus under M ₁	4.6 mm.	

***Pareumys* (?) *troxelli* sp. nov.**

Holotype: Juvenile left ramus of mandible with DP₄, M₁₋₂; fragment of left maxilla with M², A. M. N. H., No. 2021.

Horizon: Wagonhound Member, Uinta Eocene Series.

Locality: White River, Uinta County, Utah.

Diagnosis: Near *Pareumys grangeri* in size, but inferior molars with protomere buttresses less erect, trigonid cusps alternating to a greater extent, metaconids more prominent, hypoconid buttresses

⁴Troxell, Edward L., "The Eocene Rodents *Sciuravus* and *Tillomys*." Amer. Jour. Sci., Vol. 5, pp. 387-396, 1923.

more attenuate, anterior cingula descending low from metaconids; protoconid spurs directed postero-internally, somewhat as in *Sciuravus*, and descending low on posterior flanks of metaconids; longitudinal and hypolophid crests in continuous curve from protoconids to entoconids; hypolophid crests elevated, forming delicate attenuations of the hypoconid buttresses. Anterior valleys oblique, deeper and broader than in *Pareumys grangeri*, and central valleys with narrower internal exits. External valleys directed postero-internally and narrower than in *Pareumys grangeri*. M^2 with metaloph not joined to inner wall of crown, external intermediate cuspule and protoconule present, protocone strong; hypocone small, but distinct on crown surface, demarked from protocone by internal groove above; antero-internal groove also present.

This species, although combining certain characteristics of *Pareumys*, deviates from *Pareumys milleri* Peterson and the form which I have described as *Pareumys grangeri* to such an extent in other characters as to make me hesitant about assigning it to Peterson's genus.

The pattern as a whole approaches that of *Pareumys grangeri* m. The crest connecting the hypoconid and protoconid does not make an angle with the hypolophid, as in *Pareumys milleri* Peterson, where the two crests form a sort of broad Y, with the hypolophid the base

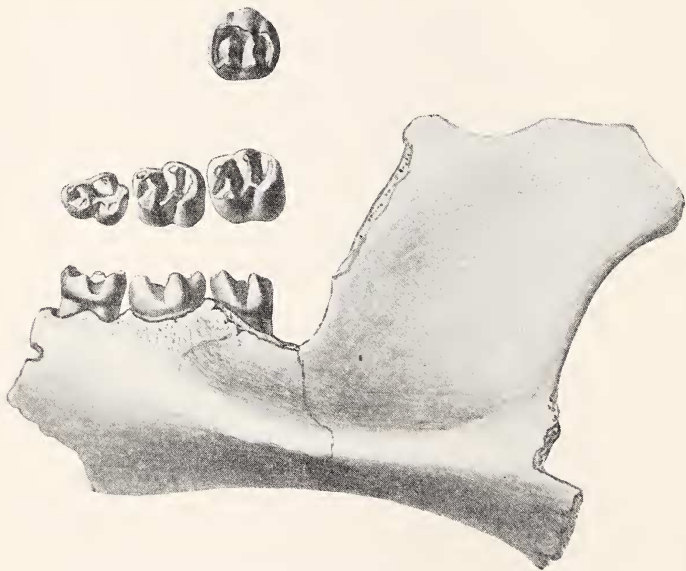


FIG. 4. *Pareumys* (?) *troxelli* Burke, holotype, A. M. N. H. 2021. External view of mandibular ramus; occlusal views of DP_4 , M_{4-2} and M^2 , x 5.

of the Y, or as in *Pareumys grangeri* m., where the crests form something of a T-design (the "longitudinal" crest, for once, being nearly longitudinal); in *Pareumys* (?) *troxelli* m. the protoconid-hypoconid crest curves postero-internally and the hypolophid continues this sweeping curve to the entoconid.

The hypolophulid crest is certainly not like that of *Pareumys milleri* Peterson, which is short transversely, as in *Ischyromys*. *Pareumys grangeri* m. shows the widely transverse type of hypolophulid crest, however. Still, there is a difference in the construction of the crest in *Pareumys grangeri* m. It is more robust, less attenuate, more distinct from the hypoconid than that of *Pareumys* (?) *troxelli* m.—and it is doubtful whether it rose as high in M_{1-2} . This crest in the species under description is strikingly like that in *Cylindrodon fontis* Douglass.

Taken as a whole, the talonids of the cheek teeth of *Pareumys* (?) *troxelli* m., with their posteriorly-curving transverse crests, attenuate hypoconids, and postero-internally directed, narrow, external valleys, show more resemblance to the talonids of the teeth of *Cylindrodon fontis* Douglass than I have seen in any other Eocene rodent.

The cusp-crest construction of the molar trigonids of this species differs from that which usually characterizes *Pareumys* mainly in the marked obliquity of the protoconid spur. It is true that the spur takes a rather variable course, even in *Pareumys*, but its prevailing course is transverse, rather than oblique. In the present species it is directed somewhat as in *Sciuravus* in M_{1-2} ; the anterior valley, in consequence, is obliquely directed also. The anterior cingulum, or metaconid spur, descends steeply toward the protomere. Since both trigonid spurs fall low the "dams" of the anterior valley are very slight.

The conversion of a trigonid of this type into that of *Cylindrodon* requires little more than elevation of the connecting crests and the outward rotation of the posterior flank of the protoconid. If the flank of the protoconid were rotated in this manner, the protolophid would be drawn backward, narrowing the central basin and broadening the anterior basin on the protoconid side. Such a rotation of the protoconid would also draw the latter cusp closer to the hypoconid. This realignment of the protoconid might accompany hypsodonty, which would tend to make the outer walls of the crown steeper, and to elevate and rotate the protoconid in the process.

Although the central basin of *Pareumys* (?) *troxelli* m. gives no indication of being converted into a persistent fossette of the type found in *Cylindrodon*, such a structure might likewise be expected to develop with the acquirement of hypsodonty.

Wilson⁵ has recently suggested that *Pareumys* "is quite possibly ancestral to *Cylindrodon*." I am not disposed to take this position regarding the advanced *Pareumys milleri* Peterson, which appears to me to be trending in the way of an *Ischyromys*-like dentition, or even toward *Pareumys grangeri* m., which seems to be evolving in the same general direction. However, it seems to me that *Pareumys* (?) *troxelli* m. has attained various characters which, by further specialization, might have resulted in the *Cylindrodon* type of dentition; the Uinta species, in other words, has the structural possibilities of evolution toward *Cylindrodon*. Yet I do not think that we should regard it, for the present, as anything more than a structural ancestor of *Cylindrodon*. Lower Oligocene rodents, such as *Ardynomys*, *Pseudocylindrodon*, and other forms as yet undescribed, contemporaries of *Cylindrodon* and less specialized, preserve various structures "ancestral" in essentially the same sense, to those of *Cylindrodon*. And I cannot escape the conviction, gained from observation of the tempo of rodent evolution in a few cases where we have fair evidence of direct descent, that the ancestor of *Cylindrodon* in the Upper Eocene had progressed beyond the stage represented in *Pareumys* (?) *troxelli* m.

MEASUREMENTS

Holotype, A. M. N. H. 2021

M ² antero-posterior.....	2.0 mm.
M ² transverse.....	2.0 mm.
Inferior I antero-posterior.....	1.8 mm.
Inferior I transverse.....	1.2 mm.
DP ₄ antero-posterior.....	1.8 mm.
DP ₄ transverse.....	1.3 mm.
M ₁ antero-posterior.....	2.0 mm.
M ₁ transverse.....	1.8 mm.
M ₂ antero-posterior.....	2.0 mm.
M ₂ transverse.....	2.0 mm.
Depth of ramus under M ₁	4.3 mm.

⁵Wilson, Robert W., "Cricetine-like Rodents from the Sespe Eocene of California." Proc. Nat. Acad. Sci., Vol. 21, No. 1, p. 31, 1935.